Injury Control Update

INJURY CONTROL

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Biomechanics delivers powerful measures for preventing injury

The year is 1954. The place is a winding, two-lane road in a rural area. As a car approaches a curve, the driver swerves to miss a deer. He overcorrects, crosses the solid yellow line, and collides head-on with an oncoming car. Both drivers die at the scene from head and chest injuries.

Flash forward forty years or so. The same scenario, the cars crash. This time, both drivers walk away with only minor injuries. The difference? Safety belts, air bags, and front-end protection.

Examples like this of the life-saving value of improved motor vehicle design abound, and so do examples of protection from other safety measures, like soccer helmets, ergonomically designed floor thresholds, and high-speed rotary machines with protective guards. But how many people know about the science of biomechanics, which is responsible for developing them? The field has been hailed as one of the most powerful countermeasures for preventing injury, and yet the science and its potential remain a mystery to most people and even to many injury control practitioners.

Using engineering, mathematics, and physics to determine how the human body responds to "insult," biomechanics researchers provide the fundamental understanding needed to develop interventions that will reduce trauma, save lives, and lower the cost of treating injuries. Perhaps

CONTINUED ON PAGE 4

Photo courtesy of the Insurance Institute for Highway Safety

Crash-test dummies are the most familiar of the biomechanics researchers' tools. Studies using them have led to many life-saving improvements in motor vehicles.

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INNOVATIONS

Illinois license plates promote, help finance violence prevention

The "Innovations" column appears for the first time in this issue of Injury Control Update. *The column will feature new ideas that are showing promise in preventing injury. We invite you to let us know about fresh approaches to injury control in your state or community. Please send submissions to Editor Gwen Ingraham at NCIPC, CDC, MS K-65, 4770 Buford Highway, NE, Atlanta, GA 30341-3724, or send an E-mail to gni1@cipcod1.em.cdc.gov*

In a first for the nation, Illinois has created a separate state authority to plan, coordinate, fund, and evaluate violence prevention efforts. Even more impressive is the state's way of financing the authority and its programs: a separate fund that will seek private and public dollars to be used exclusively for violence prevention.

> ***"We knew we couldn't compete for dollars out of the state's general revenues. We had to come up with an alternate financing mechanism."***
>
> — Barbara Shaw
> Executive Director
> Illinios Council for the
> Prevention of Violence

Special license plates will generate the initial revenues for the Violence Prevention Fund. Two peace symbols—a dove and an olive branch—adorn the license plates, and the initials "PV" identify the plates as supporting prevention of violence.

This innovative approach was spearheaded by the Illinois Council for the Prevention of Violence (ICPV), a statewide coalition of diverse groups representing public health, law enforcement, the state medical society, and a wide range of civic and community organizations. With a track record of initiating regional networks on prevention of youth violence and other prevention activities, the council set two major policy goals: to increase resources for state and local violence prevention programs and to create an infrastructure to coordinate the effort. With backing from key legislators, state officials, and a broad base of community groups, the legislation sailed through the Illinois General Assembly with no opposition and was signed by Governor Jim Edgar in the summer of 1995.

License plates carry the message

As of August 1, more than 15,000 of the special plates had been sold, and the campaign expects to sell as many as 80,000 over the next several years. Each plate costs $88, as opposed to $48 for a standard plate in the state. Of the $40 difference, $25 goes to the Violence Prevention Fund and $15 for production costs. Annual renewals will cost an additional $27 over regular renewals, with $25 going to the fund.

The idea for this funding emerged from ICPV meetings about ways to raise funds that would be dedicated solely for violence prevention. "We knew we couldn't compete for dollars out of the state's general revenues," said Barbara Shaw, executive director of the ICPV. "We had to come up with an alternate

Chicago Tribune photo by Karen Engstrom

Barbara Shaw, executive director of the Illinois Council for the Prevention of Violence, displays Illinois' special violence prevention license plate, proceeds from which support violence prevention in the state.

financing mechanism." The license plate concept was ideal for their purposes, Ms. Shaw said. "It's voluntary, it educates people, and it symbolizes the issue with beautiful art."

The idea was modeled after a license plate that raised money for environmental causes in the state.

Influential supporters helped promote cause

Support at two levels helped assure unanimous passage of the legislation. First, the council won the backing of key state leaders. Tom Ryder, the majority leader in the House and chair of the appropriations committee, helped garner bipartisan House and Senate support. The state attorney general, Jim Ryan, was involved early on; his past record of commitment to prevention of domestic and child abuse made him an ideal champion for the initiative.

In addition to leadership at the state level, a broad grassroots network of groups and individuals kept the issue prominent by promoting the cause of violence prevention with their legislators and the public. The bill passed without a single "no" vote. "The time was right," said Ms. Shaw. "There's a great deal of concern about violence, and we had across-the-board support."

The Violence Prevention Authority is co-chaired by Attorney General Ryan and the state director of public health, Dr. John Lumpkin, signifying a commitment to a combined public health-public safety approach to addressing the problem. Other groups represented on the authority include state agencies and nongovernmental members representing health, justice, and civic and business organizations.

Community violence prevention efforts to be funded by the authority include youth violence prevention programs, school-based prevention efforts, early childhood intervention programs, family violence and sexual assault prevention programs, and approaches to creative law enforcement and community policing.

The new state program will vigorously pursue funding from private sources, as well as state or federal funds. "The license plate is just a beginning," said Ms. Shaw. "But it's a great beginning." ■

BIOCAD: dynamic, interactive, powerful

As biomechanics is changing our environment to improve safety, the field itself is evolving and progressing rapidly. Traditionally, researchers have used crash-test dummies, cadavers, and animals to study the mechanics of impacts on the human body. But a new technology on the horizon holds promise as an alternative to these methods. BIOCAD—which merges the science of bioengineering (BIO) with computer-aided design (CAD)—will be a computer-based compilation of all existing information about the interaction of the human body and energy. The system will use high-speed digital computers and three-dimensional simulations of the human body to show what happens during injury. "It will be a dynamic, interactive, and powerful tool," predicted Dr. Thibault, who originated the concept of BIOCAD.

BIOCAD will allow researchers to tap into decades of research data, create a multitude of injury scenarios on screen, watch computer-animated recreations of these events in delayed or real times, and analyze the injuries on screen down to the level of tissue and cell with a high degree of anatomical accuracy.

Dr. Thibault gave an example. "You could simulate a child falling from a 4-foot drop onto a particular type of playground surface, and you could observe the injuries. You could then design a different surface and rerun the program to see the results with the new surface. You create the environment, you then look inside the body to see the stresses, strains, and vascular damage, and you predict with some level of confidence what would happen."

Biomechanics experts are excited about BIOCAD's potential and predict that it will advance the field at a rapid pace, opening research opportunities to people who have practical problems to solve, but lack resources. "Engineers and scientists will be able to conduct once highly expensive research experiments at a fraction of the cost of traditional methods, therefore advancing the science in a quantum leap," said J. Howard Hill, director of NCIPC's Office of Research Grants, which established CDC's sponsorship of the initial development of BIOCAD. "BIOCAD's potential is unlimited, not only in research to prevent injuries, but also in training for trauma surgeons and rehabilitation scientists."

Developing interventions based on biomechanics

How does research in biomechanics get translated into specific interventions that can prevent or ameliorate the impact of injuries? Dr. States described five steps in the process:

- *Identify injuries that are the most costly to society.* These are the injuries that either are life-threatening or cause permanent impairment and disability. Epidemiology is essential in identifying the most significant injuries.

- *Determine the injury mechanism.* A crucial question is, How does a particular type of injury actually happen? Is the damage caused by the sheer force of impact, or by the body twisting on impact, or remaining rigid, or by some other mechanism?

- *Determine the tolerance to impact of the injured tissue.* This step examines how much energy and what kind of energy cause injury.

- *Develop and evaluate a specific intervention.* The key is to find an intervention that can keep the forces and accelerations below the point at which they cause injury.

- *Manufacture the device and market it to the public.*

CDC-FUNDED BIOMECHANICS RESEARCH PROJECTS

NCIPC has recently funded research projects that examine various facets of biomechanics. The first two projects listed below address injuries related to motor vehicle crashes, and the following seven emphasize other types of unintentional injury. The name and affiliation of the principal investigator, plus a contact number, are included in brackets.

The Mechanics and Biomechanics of Rollover Casualties [Kennerly Digges, PhD, DeBlois & Associates; (804)924-6230]

Biomechanics of Side Impact [Albert King, PhD, Wayne State University; (313)577-1344]

Injury to Articular Cartilage Following Blunt Impact [Roger Haut, PhD, Michigan State University; (517)355-0320]

Spectral Signature as a Predictor of Fall in the Elderly [Bruce McClenaghan, PED, University of South Carolina; (803)777-5267]

Biomechanical Aspects of Spinal Trauma [Barry Myers, PhD, MD, Duke University; (919)660-5150]

Biomechanics of Cervical Cord Injury [Frank Pintar, PhD, Medical College of Wisconsin; (414)384-2000, x1534]

Biomechanics of Slips on Ramps and Level Surfaces [Mark Redfern, PhD, The Eye and Ear Institute of Pittsburgh; (412)647-7923]

Dually Stiff Floors for Injury Prevention of the Elderly [Donald Streit, PhD, Pennsylvania State University; (814)865-1972]

Spinal Canal Geometry Changes in Vertebral Fracture [Allan Tencer, PhD, Harborview Medical Center, Seattle; (206)223-5414]

Take for example, hip fractures, which are a major problem in the United States, especially with its fast-aging population. About 280,000 people fracture their hips each year; about a quarter of them die as a result, and another quarter never walk again. Medical costs associated with hip fractures are estimated at about $10 billion.

CDC-supported studies of residents at three nursing homes found that most of the older people who had hip fractures had fallen sideways. Contrary to popular belief, these people did not break their hips by twisting them as they fell. They broke their hips only when there was direct force on the greater trochanter, the bony knob of the hip.

Two products that have evolved from these studies focus on reducing the force of a fall on the body, rather than on preventing falls. One product is an energy-absorbing pad containing silicon putty, which could be sewn into clothing. The

other is flooring material that buckles and yields under impact, thus absorbing the force of a fall.

Biomechanics challenges assumptions

Biomechanics research often challenges conventional thinking, as it has in describing what happens when older people fall. Barry Myers, MD, PhD, of Duke University's Department of Biomedical Engineering, offered another example, this one having to do with neck injury.

In investigating the role of a range of devices to protect against neck injury, Dr. Myers and his research team posed basic questions: Do they work? Do they help people? Do they make people more resistant to injuries? Common sense suggests that surface padding would enhance a helmet's impact-absorbing effect. But in some situations, Dr. Myers and his team found, surface padding may actually put the neck at risk.

Conventional wisdom held that impact was the main factor in a neck injury. However, the Duke experiments showed that padded surfaces increase the risk of neck injury because they hold the head still, causing the falling body to put all its pressure on the neck.

Padded surfaces have the potential to do harm as well as good, Dr. Myers said. "That idea had never been demonstrated quantitatively."

Just as understanding the mechanism of hip fractures has led to hip pads and soft flooring, our understanding of how soft surfaces contribute to neck injuries might help us develop ways to protect a rider thrown from a horse or a passenger in a rollover collision.

CDC leads the way in biomechanics research

CDC is a major supporter of biomechanics research at the federal level, with NCIPC supporting many biomechanics research projects around the country. To date, CDC has committed about $13.8 million to the extramural biomechanics projects (See list of projects on page 6). NHTSA, the National Institutes of Health, and various military agencies also fund biomechanics research programs.

"Biomechanics tells researchers how to modify the environment and provides new tools to prevent or modify injuries." Dr. Myers said. "It gives the injury community one of its greatest returns on its investments." ■

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DIRECTOR, CDC
David Satcher, MD, PhD

DIRECTOR, NCIPC
Mark L. Rosenberg, MD, MPP

EDITOR
Gwen Ingraham

MANAGING EDITOR
Katie Baer, MPH

WRITER-EDITORS
Virginia Ross, PhD • Daphna Gregg, RN
Valerie R. Johnson

LAYOUT ARTISTS
Martha Boyd • Leslie S. Parker

Direct editorial correspondence to:
Gwen Ingraham, Director, Office of Health Communications, NCIPC, CDC,
MS K-65
4770 Buford Hwy. NE • Atlanta, GA 30341-3724
Internet: GNI1@CIPCOD1.EM.CDC.GOV

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CHILD CAR SAFTY SEATS

Imaginative Louisiana program links education and evaluation

Creative evaluation—is that an oxymoron? Not if you're in Louisiana, and you want to document that correct use of child car safety seats saves lives.

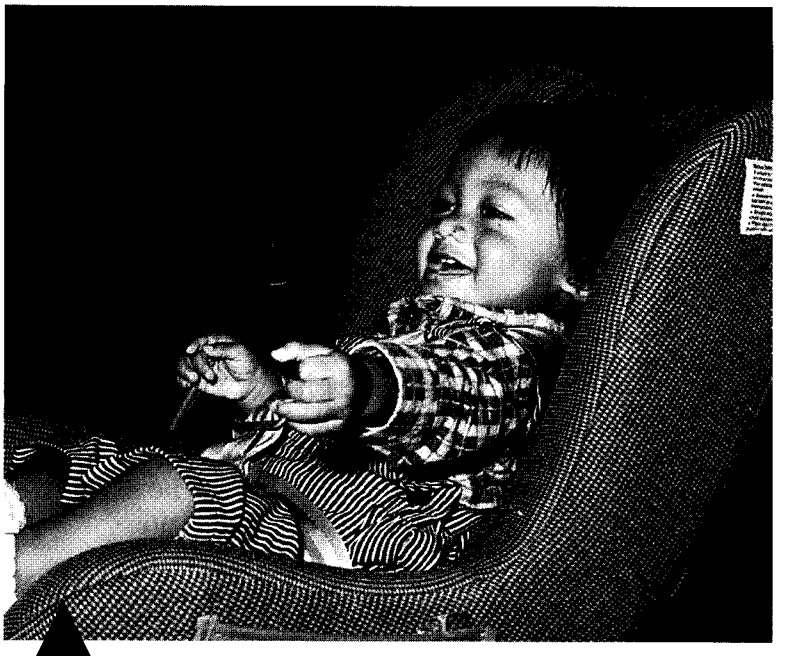
The creativity began when David Lawrence, MPH, supervisor of injury epidemiology for the Injury Research and Prevention Section of the Louisiana Office of Public Health, and his colleagues examined surveillance data on spinal cord injuries (SCIs) in the state. Their review showed that most children with motor vehicle-related SCIs had medical costs reimbursed by Medicaid. And they knew from a statewide baseline survey that only about 18% of children were restrained in car seats or seat belts. Those findings in turn prompted the health department, with CDC support, to launch a car safety seat loaner program at the local health departments in three southeast Louisiana parishes in 1990.

Typical loaner programs provide a child safety seat to families but leave out an important component: showing parents how to use the seat correctly. And studies show that an incorrectly restrained child is at increased risk of injury in a crash.

Health educators at the local health clinics went the extra mile by educating families who borrowed a car seat, Lawrence said. "They would go out to the family's car, show them how to put the seat into the car properly, how to restrain the child—and then observe the family do it."

Would adding this extra education and practice make a difference in reducing serious injuries among children involved in motor vehicle crashes?

Again, Louisiana took a creative approach. The project asked families to return car seats that had been in a car



CDC staff photo

When Louisiana's car seat loaner program added education and practice in using car seats, it paid off in lives saved.

involved in a crash: the incentive for returning the damaged seat was replacement with a new model. With the identities of the families established through the records linked to the returned car seats, Lawrence then went to the state police for follow-up information about the crash.

Typical loaner programs provide a child safety seat to families but leave out an important component: showing parents how to use the seat correctly.

The findings were impressive. Out of 26 loaned car seats known to have been involved in crashes between 1990 and 1993, 24 were returned, and police information could be obtained about all but one of those crashes. Of the 23 crashes for which information was available, 17 resulted in the hospitalization or death of at least one unbelted adult occupant—in none of those cases was an infant or young child seriously injured. "This demonstrates that proper use of child car safety seats can reduce injuries," Lawrence said. "Not only is this good for Louisiana's families—it means that safety saves tax dollars."

The Louisiana injury unit received technical assistance in evaluating the project from NCIPC's Division of Acute Care, Rehabilitation Research, and Disability Prevention. Lawrence expressed appreciation for this support, saying that having a national organization help with the study design gave assurance that the results were meaningful and would be comparable to those in other parts of the country.

Overall funding for the project came from the Disability Prevention Program (DPP) in the National Center for Environmental Health at CDC. NCIPC addresses injury-related disability in partnership with DPP and serves as project technical advisor to the DPP program grants.

The multiplier effect

Although it no longer provides the car seats or direct training, the unit remains active in motor vehicle prevention through train-the-trainer programs, evaluation, and coordination efforts. A number of other organizations and community-based groups now carry out essential parts of the car seat program, Lawrence said.

From the beginning, the Louisiana Highway Safety Commission was a partner in the car safety seat project, helping to provide the seats, staff the evaluation project, and obtain crash data. Lawrence applauded their role: "Because of their ties to transportation and public safety agencies, they were able to cut through red tape in ways that the health department can't always do. We are fortunate in Louisiana in having a productive relationship with the commission."

As the Injury Research and Prevention Section moved to a train-the-trainer approach, they enlisted the help of local police departments and Safe Kids chapters to take on the role of educating families about the proper ways to use car safety seats. Lawrence said that involving local police in this effort helped promote better enforcement of safety seat laws, while giving the law officers a direct way to foster good community relations. ■

FAMILY AND INTIMATE VIOLENCE

Milwaukee mobilizes resources to keep women "Safe at Home"

As the big white city buses roll through the streets of Milwaukee, they spread powerful messages about preventing domestic violence.

All 550 buses of the Milwaukee Transit Company feature inside placards with the image of a man's face overprinted with this stark tag line: "He threatened her. He beat her. He raped her. But first he married her."

Posters with other messages are displayed on the sides and backs of 100 buses that cover different routes throughout the city. The images depict a woman ("You promised not to break her heart. How about her nose?") and a child ("In a violent relationship, your partner isn't the only one who's scarred for life").

These "moving billboards" are the first phase of a public awareness campaign spearheaded by the Milwaukee Women's Center, Inc. (MWC) as part of a comprehensive effort to decrease violence against women. The "Safe at Home" project will also evaluate three different approaches to working with batterers, as well as train health professionals and provide violence prevention education in the schools and community. Partners in the project include Sojourner Truth House, Inc.; Asha Family Services, Inc.; and the University of Wisconsin-Milwaukee School of Social Welfare.

The Milwaukee project is one of five NCIPC-funded community-based evaluations of interventions to reduce family and intimate violence nationwide. The other projects are in Atlanta, Houston, Duluth, Minnesota, and Johnson County, North Carolina.

Private sector response

The underpinnings of the powerful posters include a survey of public perceptions about violence, pro bono contributions by a top-notch advertising firm and other media companies, and review of the materials by affected

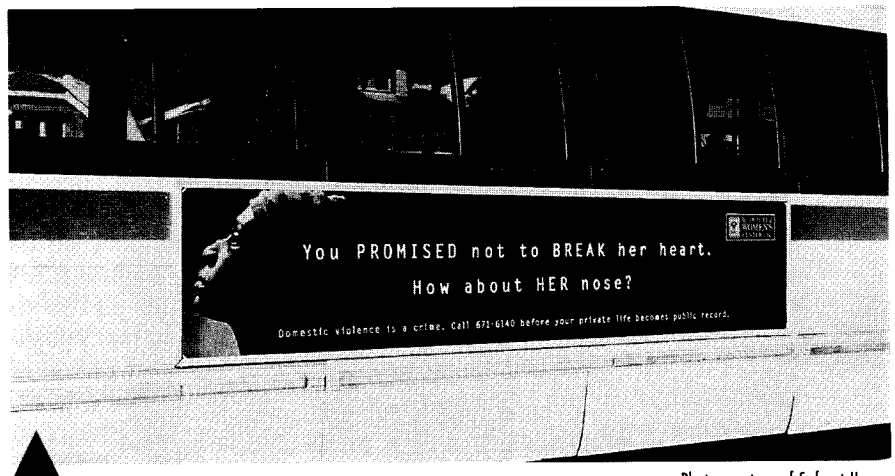


Photo courtesy of Safe at Home

Milwaukee's "moving billboards" are part of the city's "Safe at Home" project, which along with four other projects around the country, will evaluate interventions to reduce family and intimate violence.

groups—residents of battered women's shelters and participants in batterers' groups.

> *"When you have something to offer and you reach out and ask for help, people in the community really respond."*
>
> — Terry Strodthoff
> Project Manager
> Safe at Home

The catalyst for the community's involvement in the campaign was Carey Tradewell, executive director of the MWC and a well-respected community activist. When she gave a talk about the Safe at Home project to the Milwaukee Advertising Club, she sparked the interest of Bill Eisner, club president and owner of William Eisner & Associates, a major advertising firm in the city. He approached Ms. Tradewell about "adopting" the project for the life of the campaign. He collaborated with another ad agency, Kohnke & Koeneke, for the creative work. Bob Guiffra at P & C Media made available public service advertising space on the buses for the life of the campaign, a contribution of well over $100,000.

"The excitement about the campaign just kept snowballing," said Terri Strodthoff, project manager for Safe at Home. She said that the Milwaukee groups involved in domestic violence prevention have a history of working together and providing a coordinated community response. With the public awareness campaign, the collaboration has spread to the private sector and groups not traditionally involved in such activism. "When you have something to offer and you reach out and ask for help, people in the community really respond," said Ms. Strodthoff.

The campaign, which began in February, has sparked interest in family and intimate violence issues throughout the city. Media coverage has been sustained and positive, and hotline calls to the MWC and Sojourner Truth House indicate that people are responding to the "moving billboard" campaign. One man told the hotline operator that, after seeing the posters for weeks, he finally acknowledged to himself that he was an abuser and needed to do something about it.

Campaign reflects real concerns

The campaign messages were developed by listening to audiotape discussions that captured the real concerns of women and men affected by domestic violence. Clients at batterers' treatment

DEFINING THE ISSUE

The term "domestic violence" has been used for many years, but people are often confused by what it encompasses. The Milwaukee Women's Center defines the term as meaning primarily physical abuse by intimate partners. Other terms, aimed at broadening the definition, are coming into use. For example, "partner violence" is sometimes used to encompass all aspects of violence—physical, sexual, and emotional—involving intimate partners. "Family and intimate violence" has been used to encompass partner violence, child abuse, elder abuse, dating violence, children affected by witnessing family violence, and other violence and abuse involving family and intimates.

programs at MWC and Sojourner Truth House talked about what might have helped deter them from committing domestic violence. Women at the two agencies' shelters also talked about the experience of partner abuse in their lives. With those perspectives, William Eisner & Associates developed key messages and visuals and then went back to the groups to get their reactions.

A survey of Milwaukee County residents also generated ideas for the campaign. The study, administered by the Social Science Research Center at the University of Wisconsin at Milwaukee, surveyed 400 men and women randomly selected throughout the county and a subset of 100 men and 100 African-Americans. The findings helped underline the key themes of the campaign and also will serve as baseline information against which to measure changes in attitude for follow-up evaluation. (See sidebar below for highlights of the survey findings.)

The advertising firm developed creative strategies to target both men and women. For both, a main message underscored that domestic violence is a crime and that resources are available to

SURVEY CAPTURES COMMUNITY'S VIEWS ON DOMESTIC VIOLENCE

The survey conducted by the University of Wisconsin-Milwaukee and the Social Science Research Center showed that Milwaukee County residents held the following views:

- *Domestic violence is an important and widespread problem.* Almost 70% of people surveyed said they personally knew a woman who had been abused by a partner, and more than 70% said they considered domestic violence an important social problem.
- *Violence has no place in an intimate relationship.* Almost three-quarters of the public said that even occasional physical violence in a relationship is a real problem, and an overwhelming majority is no longer willing to blame the woman for abuse or accept excuses and rationalizations for the violence.
- *Domestic violence is a crime.* Milwaukee County residents know that physical abuse in a relationship is a crime.
- *Abusive men need to be held legally and socially accountable.* Slightly more than half the people surveyed said that abusive men should be arrested for domestic violence. People also expressed a hesitation to intervene personally, if they knew about abuse.
- *Too few people know about resources for help.* Almost a third of the people surveyed did not know about places that women could turn to for help, and more than 70% were unaware of hotline or counseling services for men.
- *Men and women hold different attitudes about domestic violence.* The problem has traditionally been considered "a women's issue," with educational resources targeted primarily to women.

SOON APPEARING ON A BUS NEAR YOU....

The Milwaukee Women's Center "Safe at Home" posters may soon be appearing on buses across the country. States from coast to coast are ordering the posters, reported Terri Strodthoff, project manager for Safe at Home.

The posters and the public awareness campaign against domestic violence have been so successful that they have attracted the attention of the Office of the Secretary at the U.S. Department of Health and Human Services (DHHS), which is considering ways to create new messages about domestic violence at the national level.

"The Milwaukee Women's Center campaign is powerful and beautifully designed and executed," said Peter Edelman, Assistant Secretary for Planning and Evaluation for DHHS. "We need to find ways to get messages like these out in every community."

The center's public awareness campaign has drawn praise from the advertising industry as well, garnering the prestigious Gold World Medal for the best transit advertising campaign entered in the New York Festivals competition. The center's Safe at Home poster campaign and two of the posters were among the winners, which were selected from more than 5,000 entries representing 56 countries. The center also won six Milwaukee Advertising Club ADDY awards.

help. Women were encouraged to seek support from community groups and not remain victims; men were encouraged to seek help before their feelings turn violent.

A series of six print images capturing these ideas was developed for the bus campaign and for 11,000 posters that will be distributed to businesses, medical and social service agencies, and other organizations throughout the community. Radio and television public service announcements incorporating the same visual and verbal themes will begin later this year.

Another important piece of the communications campaign is the Safe at Home brochure, developed with funding from the Department of Social Services and Aurora Health Care, Wisconsin's largest not-for-profit health care system in the state. The brochure highlights key facts about family and intimate violence, describes early warning signs of an abusive relationship, and lists community resources for help.

Evaluating different treatment models for batterers

Another facet of the Milwaukee program focuses on what makes an impact on men with a history of family and intimate violence. Increasingly, courts mandate that batterers participate in educational and counseling programs. The Milwaukee project supports three different treatment models aimed at reducing the incidence and severity of violence against women. Ms. Strodthoff explained that each of the three programs will be evaluated against its own goals. "We are not trying to make a comparison across groups. The programs

differ and offer different things to the community."

- ▲ *Nevermore,* the Milwaukee Women's Center program, is based on a clinical model. Eight 2-hour educational group sessions are supported by at least three individual counseling sessions. The program concludes with a clinical discharge interview, which may direct the men to additional individual or group psychotherapy. The program emphasizes the link between domestic violence and substance abuse and mental health issues.

- ▲ *Batterers Anonymous/Beyond Abuse (BA)* is the program offered at Sojourner Truth House. The largest abuse prevention program in the county, BA is a 23-week educational program led by a facilitator who helps participants focus on personal responsibility in relationships and learn skills to deal with conflict in healthy ways.

- ▲ *Ujima Violence Prevention Group* is a nontraditional abusers' treatment program that is designed specifically for African-American men. Sponsored by Asha Family Services, the 23-session program involves weekly meetings that address violence against women and children within the context of the African-American cultural experience.

Follow-up assessment of all the men will track their progress with a number of measures, including shifts in attitude. "Most of the men who come to these sessions don't want to be there—they feel pushed into it," explained Ms. Strodthoff. "We hope to help them realize that preventing domestic violence is their responsibility and to give them tools to make a change. So, we'll track changes in attitude, as well as changes in behavior."

Educational efforts target professionals, youth

Many young people know about family and intimate violence in a general sense, but are less clear about relating the information to their own relationships. The Milwaukee Women's Center offers two school-based programs for adolescents, one for young men and a new one for young women, which emphasize a preventive approach to violence against women. The 6-week programs, which have been given at seven area schools, use classroom-style presentations to help teens recognize the early warning signs of abuse in a dating relationship. Soujourner Truth House also has implemented an 8-week relationship abuse prevention program, which is offered as part of the curriculum in area high school classes.

Involving a wide range of professionals in preventing violence against women is another goal of the Milwaukee project. Curricula are being developed to provide training for different groups, including staff in the probation and parole office, various social service agencies, and emergency department staff in hospitals affiliated with the Aurora Health Care system.

Virtually all aspects of the Milwaukee project involve partners in the public, private, and nonprofit sectors, as well as medical professionals. The city has a strong tradition of groups working together in a coordinated way to identify a need and address it, said Ms. Strodthoff. "Dollars are short, but people focus on different aspects of the problem and, at the same time, come together as a united front. That approach has helped win support from the community." ■

Two options for information about NCIPC grants

Injury control professionals who want the latest news about extramural grant funding from NCIPC have two choices for obtaining information. They can access announcements through the Internet, via CDC's and NCIPC's home pages, or through an interactive, automated telephone system.

The Internet address for CDC's home page is

http://www.cdc.gov/(select "Funding")

The address for NCIPC's home page is

http://www.cdc.gov/ncipc/ncipchm.htm (select "Research Grants and Funding Opportunities")

To reach the information you want, select the specific program announcement of interest. The telephone number for the automated line is (404)332-4561. You can hear descriptions of current announcements and request full application kits for specific program announcements.

NCIPC grants to fund research centers are announced in August. Applications are due in October, and funding is awarded in late summer of the following year. For individual research projects, announcements appear during the fall, applications are due the following January or February, and awards are made by September. Grants are for periods of up to three years.

A handbook, *Guide to Applying for Injury Research Grants*, is available for those who would like guidance in completing research grant applications. For a copy, write to Office of Research Grants, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, 4770 Buford Highway, NE, MS K-58, Atlanta, GA 30341-3724, or call (770)488-4265. ■

Resources You Can Use

Inventory of Federal Data Systems in the United States for Injury Surveillance, Research and Prevention Activities
J.L. Annest, J.M. Conn, and S.P. James.

This new report describes 31 federally funded national data systems that provide information on injury mortality, morbidity, and risk factors. The inventory includes a brief overview of each data system, its data collection methods, inclusion and exclusion criteria, useful features for injury research, and summary tables of the systems' characteristics and data content.

Eight of the systems provide data on work-related injuries and deaths; the remaining systems focus more broadly on injuries and deaths related to violence and unintentional causes. Three systems provide injury cost data.

The inventory is available on NCIPC's home page (see page 19), and by writing J. Lee Annest, PhD, Director, Office of Statistics and Programming, NCIPC, CDC, MS K-59, 4770 Buford Highway, NE, Atlanta, GA 30341-3724.

POISON CONTROL

San Francisco poison control center examines impact of reduced service

Poison centers face funding crisis

Most of us take poison control centers for granted. Parents who panic at the sight of their toddler playing beside an open, empty bottle of pills count on being able to pick up the phone, dial a regional center, and get immediate and expert advice on what to do.

People also tend to take the cost savings of these centers for granted. By providing expert telephone advice to distraught parents, poison control centers avert an estimated 50,000 hospitalizations and 400,000 visits to a doctor or emergency room each year.

In fact, many poison control centers rely on an unstable patchwork of funding sources. They stay in business through partial funding from hospitals or universities, private donations, and some federal, state, and local support. The recent experience of the San Francisco Bay Area Regional Poison Control Center shows how tenuous financing can affect the quality of care of people in a poison center's service area. The withdrawal of one county's fiscal support provided an opportunity to observe what happens when a service that is taken for granted is suddenly withdrawn.

San Francisco center looks for ways to cut costs

The Bay Area poison control center serves ten counties around San Francisco. About four and a half million people live in this region, encompassing the Bay Area and California's northern coastal counties. The "center" is actually a

CONTINUED ON NEXT PAGE

Proposed E-code groupings ready for comment

NCIPC and the National Center for Health Statistics and other members of the Injury Control and Emergency Health Services section of the American Public Health Association are developing E-code groupings for reporting injury data. The intent is to work toward establishing voluntary national standards for a minimum framework for reporting morbidity and mortality data useful for injury prevention and control activities.

The proposed E-code groupings can be viewed at either of two addresses on the Internet:

http://www.cdc.gov/ncipc/whatsnew/whatnew.htm

http://www.cdc.gov/ncipc/osp/constr.htm

For more information or to comment, contact J. Lee Annest, PhD, by E-mail at jla1@cipcod1.em.cdc.gov. ■

windowless room about 8 feet by 20 feet, where up to four specialists answer a daily average of 180 calls and give advice about treating poisonings. The specialists have computers linked to Poisindex, the toxicology database. Toxicology reference texts line the shelves over the computer terminals.

Despite these modest facilities, the San Francisco center faced a funding shortfall in 1993. "Even though studies have shown that poison center intervention saves $5 for every $1 spent, or $3.3 million in health care charges each year," said Kent R. Olson, MD, medical director of the center, "poison centers have no leverage with contributors. Staff are expected to handle the emergency now and worry about getting paid later."

Indeed, without more funding for the upcoming fiscal year, the center could not have paid half the professional staff at all. San Francisco County, the center's home county, responded to the crisis by proposing a fair-share plan, according to which each county was asked to contribute local funding proportionate to the county's use of the poison center. One of the counties, with budgetary problems of its own, declined to contribute.

The center saw as its only option blocking direct public access of that county's residents to poison center services. For emergency cases, the center agreed to continue providing consultation through 911 operators on a fee-per-call basis. County residents who dialed the poison center heard a recorded message advising them to call 911 for assistance.

Evaluation finds call blocking seriously flawed

Once this mechanism had been put into place for fiscal reasons, the San Francisco center decided to use it as an opportunity to study alternative ways of providing poison control services. They received a competitive award from NCIPC for a 3-year study, with the first year focused on the effects of blocking direct access to centers, and the remaining two years on the use of alternative providers.

To evaluate changes in the volume and nature of calls coming into the center from the blocked county, investigators compared the calling history during an 8-month period under the new system with calls that had come in during the corresponding 8 months of the previous year. Then they interviewed 300 people who had called to report a poison exposure of a child 5 years old or younger, to find out what parents had done after failing to reach the poison center.

Results showed that despite the electronic blocking, more than half the callers eventually received advice from the center, mostly through dialing 911 or a local hospital. This advice was obtained, however, only after making additional calls, and sometimes with significant delays. Nearly one-fifth of callers were

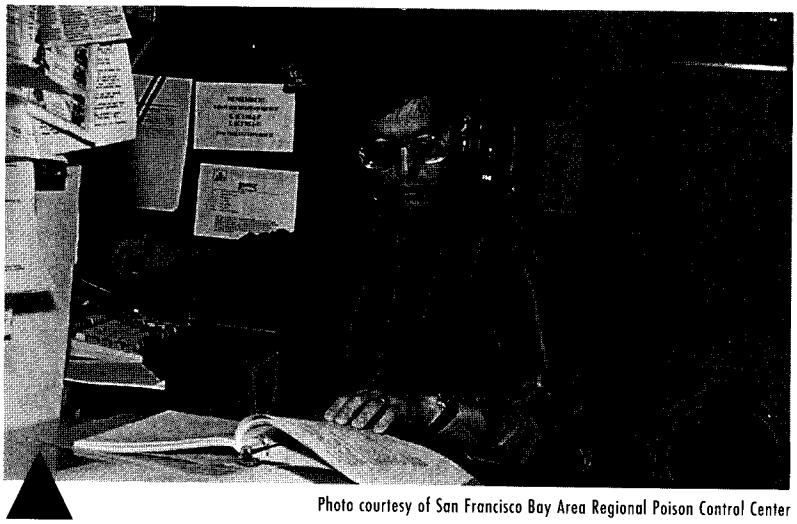


Photo courtesy of San Francisco Bay Area Regional Poison Control Center

Working in a windowless 8 by 20 foot room, toxicologists at the San Francisco Bay Area Regional Poison Control Center respond to an average of 180 callers each day. Funding shortages have forced the center to look at alternative ways to meet this need.

Although the number of children who die from poisoning has declined dramatically since the Poison Prevention Packaging Act was passed in 1970, unintentional poisoning is still an important problem among children.

- ▲ Of the 2.4 million poisonings reported to poison control centers each year, 60% involve children under 6 years of age. Children under 2 have the highest number of poisoning exposures.
- ▲ Minority children are especially at risk, with black children ages 9 and under being three times more likely than white children of the same age to die from unintentional poisoning.
- ▲ More than 90% of poisonings reported to poison control centers happen in the home.
- ▲ Easily accessible substances, like mouthwash, rubbing alcohol, iron supplements, pesticides, kerosene, and windshield washer fluid, are a serious threat to young children.
- ▲ The most frequently implicated substances are cleaning products, analgesics, cosmetics, personal care products, cough and cold preparations, and plants like aloe and philodendron.

either unable to get advice or chose to wait and watch their child to see if symptoms developed.

There were other problems as well. Many health care providers offered advice without consulting the poison center, and at times this advice was not what a toxicologist would have recommended. The poison control center was not directly accessible to physicians in private practice, and hospitals may have hesitated to increase the number of calls to the center for fear of incurring a higher membership fee. In some cases, blocked calls led to unnecessary emergency department visits, resulting in much higher costs—the average cost of a case managed by a poison center is about $25, while emergency department costs range from $95 to $400 per case.

None of the children in the survey group was seriously harmed because of call blocking, but the study showed that the potential for harm was there. In one instance, a man who had called because his 10-month-old baby was vomiting from eating chewing tobacco panicked and gave the baby mustard and then ipecac. Over the next hour and a half, he tried several more times to reach the poison center and finally took the baby to an emergency department. The child recovered with no ill effects, but the poison control center advised that the inappropriate first aid and the delay in getting medical help could have been dangerous.

When these results came in, blocked access was abandoned as a means of controlling cost. First and foremost, it held the potential of endangering lives, but it also proved not to be particularly cost effective. By essentially shifting the burden of managing poisoning cases to other parts of the emergency response system, it caused calls to the poison center from 911 operators to increase by 543%. Ironically, because the blocked county had agreed to pay the center a premium fee-per-call rate for 911 consultations, they ended up paying almost as much as they would have paid under the fair-share plan.

Training of alternative providers to be studied

The project will now turn to evaluating an approach in which calls are answered by advice nurses from health maintenance organizations or 911 operators, who will triage the calls and handle nontoxic exposures themselves. For this phase of the study, the San Francisco center will work with the Institute for Health Policy Studies at the University of California at San Francisco.

Using a system developed by the project staff, operators will lead callers through a series of questions about the substance, route, and amount of poison that may have been ingested. Depending on the answers, people will either be helped directly by the operator or transferred to a poison center specialist. The San Francisco investigators estimate that advice nurses and 911 operators will be able to handle 5% to 10% of calls to the poison center, resulting in greater efficiency and freeing toxicologists to concentrate on more urgent cases. ■

For more information, contact Patty Hiatt, Project Coordinator, at (415) 206-6878.

NCIPC home page: Correct address

The NCIPC home page is now available on the Internet. Users can find general information on the injury center, publications, research grants and funding opportunities, surveillance data, and a "what's new" section. The correct address is: http://www.cdc.gov/ncipc/ncipchm.htm.

(Please note that the address printed in the winter 1996 issue of Injury Control Update *was incorrect.)*

CALENDAR

November 10 - 12 — **National Conference on Shaken Baby Syndrome,** Salt Lake City, UT. Sponsored by the National Network on Shaken Baby Syndrome and other groups, the conference will bring together national experts in medicine, law, social services, psychology, and prevention. Sessions will focus on diagnostic techniques, litigation, victim and perpetrator profiles, impact on families, and prevention programming. **Contact:** Child Abuse Prevention Council at (801) 399-8430 or the "Don't Shake the Baby" Campaign at (719) 583-2000.

November 17 - 21 — **American Public Health Association's 124th Annual Meeting,** New York, NY. More than 12,000 national and international physicians, administrators, educators, epidemiologists, nurses, and related health specialists will attend this meeting, which will feature public health issues. This year's conference theme is social justice in public health. **Contact:** APHA, 1015 15th Street, NW, Washington, DC 20005, phone (202) 789-5600, or request a registration form via fax by calling (202) 274-4577 (request document no. 201).

International health group recognizes violence problem

Violence has been publicly recognized as a worldwide public health problem. A resolution passed in May by the World Health Assembly, governing body of the World Health Organization (WHO), noted "the dramatic increase in the incidence of intentional injuries affecting people of all ages and both sexes, but especially women and children" and acknowledged the serious implications for health and psychological and social development.

The resolution means that the member nations of WHO have endorsed the concept of violence prevention and support epidemiology, research, and prevention activities to advance that goal, according to James Mercy, PhD, acting director of NCIPC's Division of Violence Prevention, who attended the assembly meeting in Geneva, Switzerland.

"WHO is in the process of developing a plan that will integrate violence prevention into current programs like women's health, substance abuse, and adolescent health and will lead to concrete activities" said Dr. Mercy. "Just as CDC's support of violence prevention in the United States has stimulated interest in other sectors like foundations and state health departments, I would expect that WHO's support would inspire wider interest in violence prevention on a global basis."

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